Patent Claims

1. Device for actuating double seat valves
   - with two closing elements (3, 4) which are designed as seat discs and move independently to each other,
   - which enclose between them a leakage chamber (5) ,
   - which is connected via at least one path of travel with the surroundings of the double seat valve,
   - with the independently actuated first closing element (3),
   - that after a partial stroke comes to rest on the dependently actuated second closing element (4) and likewise transfers this with its further opening movement into a full open position (H),
   - with valve stems (3a, 203, 103; 4a, 204) which fit into one another in a telescoping manner and that extend outward on the side of the second closing element (4) out of a valve housing (1),
   - through which the closing elements (3, 4), additionally to the full open position (H) and independent of each other, are each able to be brought in a partially open position (T1, T2),
   - whereby the full open position (H) is generated through a main adjustment device (100) and the partially open positions (T1, T2) through the respective closing elements (3, 4) assigned individual adjustment devices (200; 200.1, 200.2),
   - the individual adjustment devices (200; 200.1, 200.2) are designed stand-alone and are additively inserted between the main adjustment device (100) and the valve housing (1)
   - and one actuating piston (205, 206 or 206/206.1) is respectively installed on a control rod (3a, 203; 4a, 204), which can be brought axially movable in one direction on the assigned control rod and in the opposite direction for engagement in a clamping connection with this control rod,
   - and whereby the second partially open position (T2) of the second closing element (4) is limited by a permanent stop position of the third actuating

piston (206; 206/206.1) which is provided in the housing (201/202) of the individual adjustment device (200),

characterized in that

a stop position of the second actuating piston (205) is relative to the housing (201/202) provided for the first partially open position (T1) of the first closing element (3) and is adjustable from its exterior in the area between the main adjustment device (100) and the individual adjustment devices (200) through a stop nut (214).

2. Device according to Claim 1, **characterized in that** the stop position of the second actuating piston (205) for the first partially open position (T1) is specified indirectly via a drive sleeve (212; 212*), which on the one side is lodged and sealed in the second actuating piston (205) and on the other side on a guide component (215), that as a separate member engages from the outside in the third housing member (201) and complementary supplements it, and whose axial displacement in the direction of the partially open position (T1) is limited by the stop nut (214), which is located on the guide component (215), is accessible from outside and is adjustable and fixable.

3. Device according to Claim 2, **characterized in that**, the axial extension of the drive sleeve (212; 212*) is designed larger than the full open position (H).

4. Device according to one of the Claims 1 to 3, **characterized in** that the third actuating piston (206) on its side facing the second actuating piston (205) is connected tightly with a smaller diameter additional piston (206.1), but is able however to be loosened, that the additional piston (206.1) working together with a housing ring (213.1) fixed on the housing (201/202) of the individual adjustment device (200) forms a fourth pressurizing medium chamber (200c), which is connected with a third pressurizing medium chamber (200b) formed between the third actuating piston (206) and the fourth housing member (202), and that with the introduction of a third pressurizing medium flow (D3) to the third pressurizing medium chamber (200b) also an auxiliary force affecting the additional piston (206.1) results additionally in the fourth

pressurizing medium chamber (200c), which additively superimposes on the force affecting the third actuating piston (206).

5. Device according to Claim 4, **characterized in that** the additional piston (206.1) has a larger diameter exterior piston section (206.1a) and a smaller diameter interior piston section (206.1b), that the interior piston section (206.1b) is sealed on its frontal end from the third actuating piston (206) and is screwed with this, that the exterior piston section (206.1a) is sealed on its periphery from the shell of a cylindrical cutout (213.1a) in the housing ring (213.1) and the interior piston section (206.1b) is sealed on its periphery in a coaxial through bore (213.1b) in the housing ring (213.1), and that in the connection area of the third actuating piston (206) with the additional piston (206.1) are located in the former a first pressurizing medium channel (206b) and in the latter a second pressurizing medium channel (206.1d), which correspond with one another and connect the third pressurizing medium chamber (200b) and the fourth pressurizing medium chamber (200c) with one another permeable to the pressurizing medium.

6. Device according to Claim 4 or 5, **characterized in that** the housing ring (213.1) has a radial projection (213.1c) on its circumference, with which the housing ring (213.1) is positively fastened in the connection area between the third and the fourth housing member (201, 202).

7. Device according to one of the Claims 4 to 6, **characterized in that** a second pressurizing medium connection (208) for a second pressurizing medium flow (D2) for pressurizing of the second actuating piston (205) located in the third housing member (201) discharges in a preceding second pressurizing medium chamber (200a*) in the area between the third actuating piston (206) and the housing ring (213.1), and that the preceding second pressurizing medium chamber (200a*) is connected with a second pressurizing medium chamber (200a) formed between the second actuating piston (205) on one side and the housing ring (213.1) in connection with the additional piston (206.1) on the other side through at least one connection channel (213.1d),

which is located in a part of the housing ring (213.1) containing the cylindrical cutout (213.1a) on the exterior.

8. Device according to one of the Claims 1 to 7, **characterized in that** the stop position of the third actuating piston (206; 206/206.1) for the second partially open position (T2) is determined by a stop ring or housing ring (213; 213.1), which is permanently located on a housing (201/202) and is axially moveable through the third actuating piston (206; 206/206.1).

9. Device according to one of the Claims 1 to 8, **characterized in that** the first control rod (3a) is screwed with its external threads with a second actuator stem (203) in the area of a second individual adjustment device (200.2), that the second actuator stem (203) is screwed with its external threads likewise with a first actuator stem (103) of the main adjustment device (100) in the area of a first individual adjustment device (200.1), and that the screwed connection of the actuator stems (103, 203) are secured firmly by a lock nut (211) located on the external threads of the second actuator stem (203).

10. Device according to Claim 9, **characterized in that** the screwed connection of the first control rod (3a) with the second actuator stem (203) is secured against loosening by a threaded section, acting as a screw lock, located in the internal threads of the second actuator stem (203).

11. Device according to Claim 9 or 10, **characterized in that** the first actuator stem (103) is provided with a continuous pressurizing medium bore hole (103a) in its longitudinal axis, which leads over cross holes (103b) into a first pressurizing medium chamber (100a) of the main adjustment device (100).

12. Device according to one of the Claims 1 to 11, **characterized in that** the housing members (101, 102) of the main adjustment device (100) and each (201, 202) of the individual adjustment devices (200) are made from housing rough parts of the same shape.

13. Device according to one of the Claims 1 to 12, **characterized in that** the housing member (101, 102) of the main adjustment device (100) and each (201, 202) of the individual adjustment devices (200) are each integrally joined with each other.

14. Device according to one of the Claims 1 to 13, **characterized in that** the actuating pistons (205, 206; 206/206.1) and an actuating piston (104) of the main adjustment device (100) each are made out of corrosion resistant light alloy.

15. Device according to one of the Claims 1 to 14, **characterized in that** the following arrangement, made up of a guide component (215) in connection with the stop nut (214), the drive sleeve (212), the second actuator stem (203) in connection with the lock nut (211), a third actuator stem (204) and a second spring (207) located between the latter and the second actuator stem (203), is totally extendable out of the assembled individual adjustment devices (200) in the direction of the main adjustment device (100) flanged on the latter.

16. Device according to one of the Claims 1 to 15, **characterized in that** after loosening the screw connection between the first control rod (3a) and the second actuator stem (203) the pretensioning of the second spring (207) is relieved.